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Power Purchase Agreements

Overview



- On-site renewable power purchase agreement (PPA) definition



- When to choose PPA



- Project steps



- Contractual issues



- Example projects

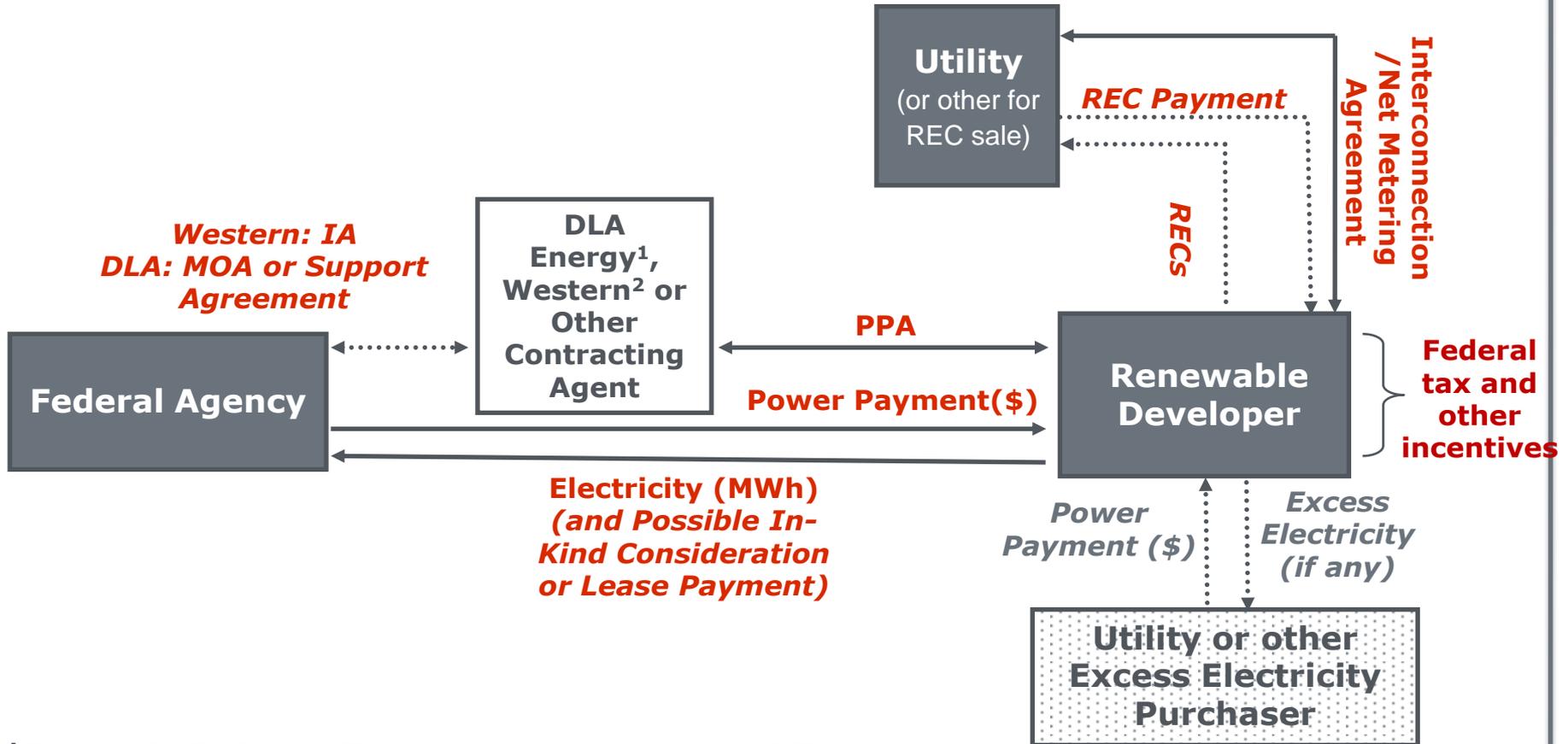


- PPA support, resources and key points

Customer-Sited Power Purchase Agreement

- Private entity purchases, installs, owns, operates and maintains customer-sited renewable equipment
- Site purchases electricity (or thermal energy) through power purchase agreement (PPA)
- Pros
 - Renewable developer (or partner) eligible for tax incentives, accelerated depreciation
 - No agency up-front capital required
 - Renewable developer provides O&M
 - Minimal risk to government
 - Usually known long term electricity price for portion of site load
 - On-site projects are encouraged for meeting federal renewable goal and are eligible for double bonus
 - Good alternative to purchasing renewable energy certificates (RECs)
- Cons
 - Transaction costs
 - Limited federal sector experience
 - Contract length limitations

PPA Diagram



¹Formerly Defense Energy Support Center (DESC)

²Western = Western Area Power Administration

Contracts/Agreements Associated with PPA Projects

- **PPA:** Federal agency, DLA Energy (formerly DESC) or Western Area Power Administration (Western), and Renewable Developer
- **Land Use Agreement:** Federal agency and Renewable Developer
- **Interconnection/Net Metering Agreement:** Utility and Renewable Developer (and/or federal agency)

Possible Additional Agreements

- **Interagency Agreement (IA):** Western and federal agency
- **Support Agreement or MOA:** DLA Energy and federal agency
- **REC Contract:** Renewable Developer and Utility (or other REC purchaser)
- **Excess Electricity Contract:** Developer and Power Purchaser

When To Choose PPA

- Relatively large renewable project (typically greater than 1 MW, although a smaller project could attract interest)
- Limited energy efficiency opportunities, or energy efficiency being addressed through other contractual vehicles such as UESC or ESPC
- Estimated renewable energy generation is less than or approximately equal to annual electricity usage
 - If it is likely that estimated generation will be greater than usage at any time then net metering is critical
- No EUL authority

Key Steps

- **Step 1: Go/no go considerations**
- **Step 2: Renewable project cost effectiveness**
- **Step 3: Select contracting methodology**
- **Step 4: Address key issues**
- **Step 5: Procurement**
- **Step 6: Construction, publicity and project operation**

Step 1: Go/No Go Considerations

- PPA legality
- Who owns the land and/or building(s)?
- Is the site management by an M&O or other management company?
- Who pays the utility bill?
- Future site plans – is there any chance of building/site shut-down?

PPA Policies

DSIRESOLAR™

Database of State Incentives for Renewables & Efficiency

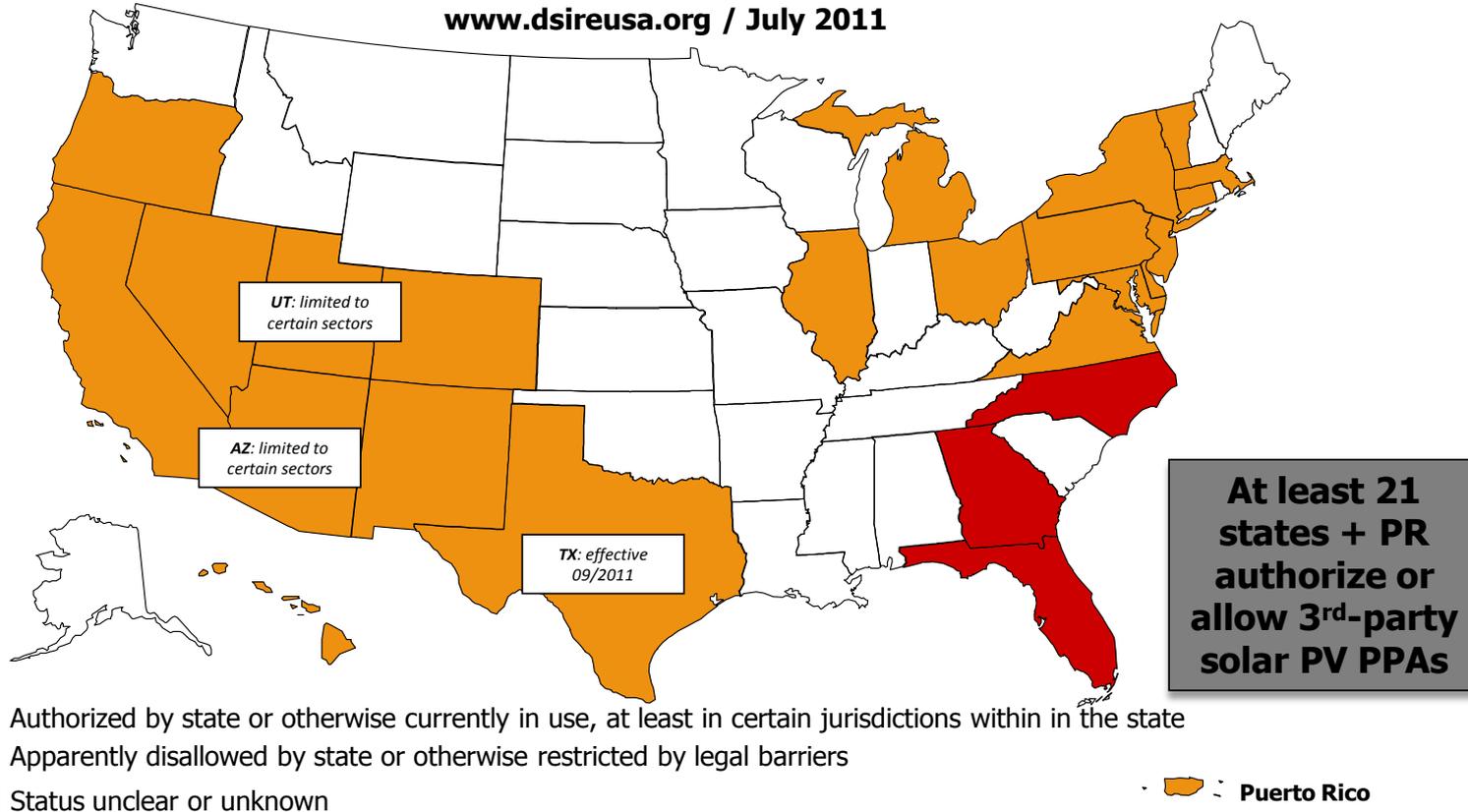
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

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3rd-Party Solar PV Power Purchase Agreements (PPAs)

www.dsireusa.org / July 2011



Note: This map is intended to serve as an unofficial guide; it does not constitute legal advice. Seek qualified legal expertise before making binding financial decisions related to a 3rd-party PPA. See following slides for additional important information and authority references.

Step 2: Renewable Project Cost Effectiveness

- Gather utility information – tariff/cost, electric supply contract (if applicable), standby charges
- Compare energy usage information to renewable generation (project simpler if site will use all of the energy)
- Research renewable energy certificate (REC) markets, applicable incentives (rebates, tax incentives, etc) and renewable policies (net metering, feed-in tariff, community solar, etc.)
 - See <http://www.dsireusa.org/>
- Renewable screening, feasibility study and/or business case analysis

Net Metering

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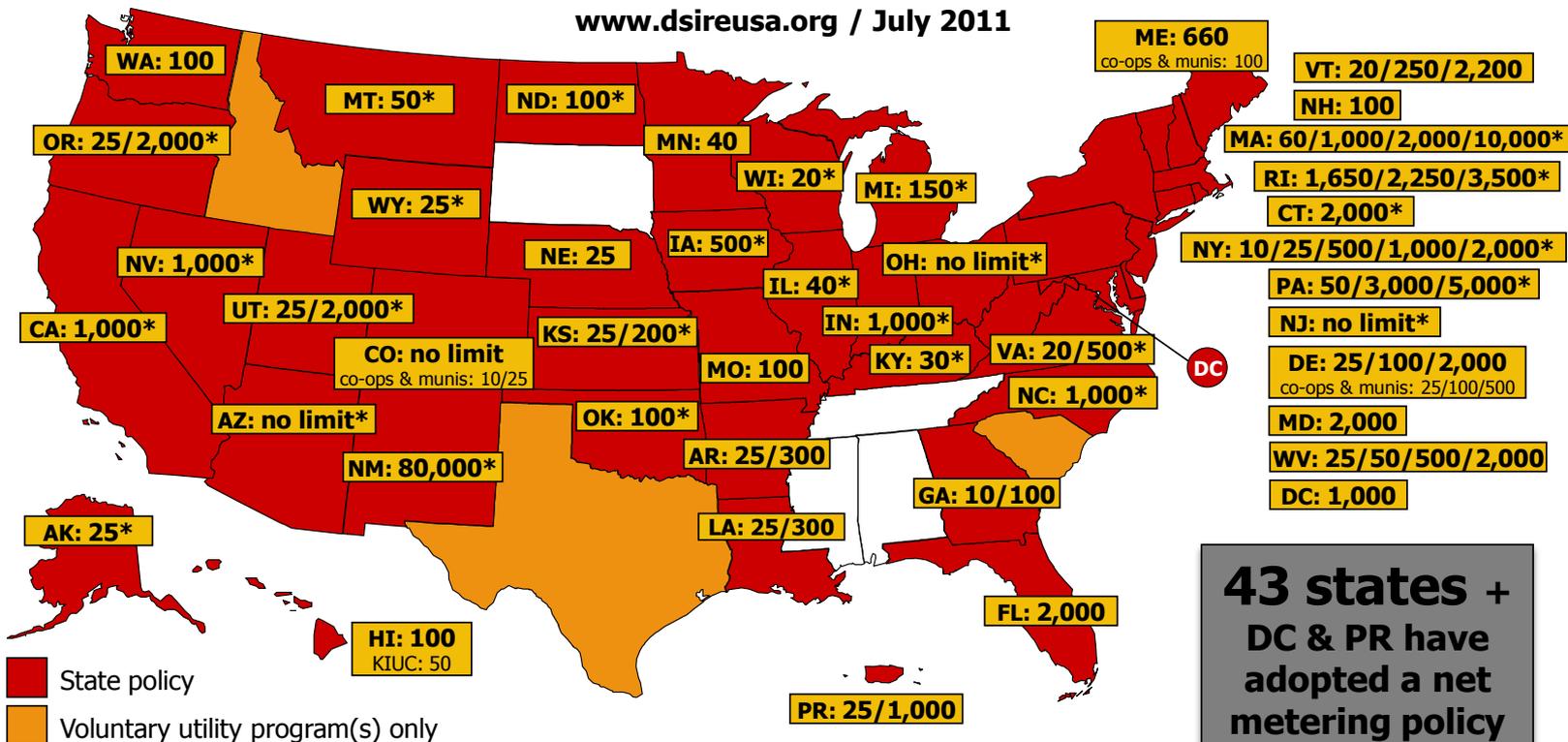
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Net Metering

www.dsireusa.org / July 2011



**43 states +
DC & PR have
adopted a net
metering policy**

* State policy applies to certain utility types only (e.g., investor-owned utilities)

Note: Numbers indicate individual system capacity limit in kW. Some limits vary by customer type, technology and/or application. Other limits might also apply.
This map generally does not address statutory changes until administrative rules have been adopted to implement such changes.

RPS Policies with Solar/DG Provisions

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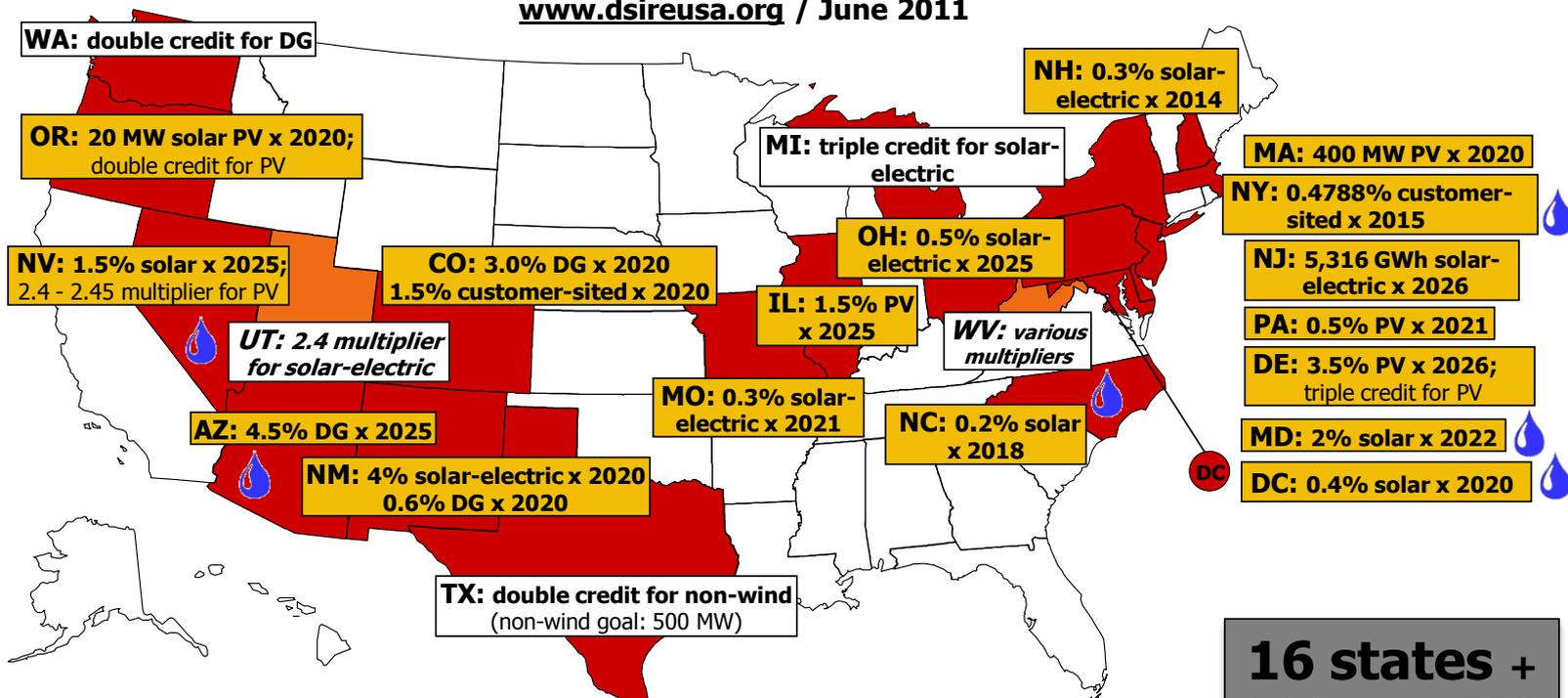
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RPS Policies with Solar/DG Provisions

www.dsireusa.org / June 2011



- Renewable portfolio standard with solar / distributed generation (DG) provision
- Renewable portfolio goal with solar / distributed generation provision
- Solar water heating counts toward solar provision

16 states + DC have an RPS with solar/DG provisions

Step 3: Select Contracting Methodology

- Site or other agency contracting staff
- DLA Energy (formerly Defense Energy Support Center)
Renewable Team lead by:
 - Andrea Kincaid, DLA Energy - andrea.kincaid@dla.mil, 703-767-8669
 - John Nelson, DLA Energy - john.nelson@dla.mil, 703-767-8523
 - <https://www.desc.dla.mil/DCM/DCMPage.asp?pageid=589>
- Western Area Power Administration (Western)
 - Note that site must select the renewable developer

Step 4: Address key issues

- Contract Length - at least 10 years, preferably 20
 - FAR Part 41 Utility Services (10 year authority)
 - DOD 10 USC 2922A (up to 30 years)
 - Use Western Area Power Administration (at least 20 years)
- Coordination with local utility
 - VERY important to notify the utility early on in project development
 - Interconnection considerations: application, cost and study requirements; queue and timeframe, agreement terms & conditions
 - Renewable system tie-in options
 - Utility bill impacts, applicable policies such as net metering
- NEPA and other environmental issues
- Land use agreement

Step 4: Address key issues

Western Area Power Administration (Western) Option

- Long term contract authority - at least 20 years
- Western can sign PPAs for Federal agencies in their service territory
- Site selects renewable developer and brings to Western
- Examples: NREL, Fort Carson
- Nominal fee for Western's services
- Renewable Resources for Federal Agencies (RRFA) program

Randy Manion, (720) 962-7423,

manion@wapa.gov

<http://www.wapa.gov/powerm/pmtags.htm>

(See program brochure at bottom of web site)

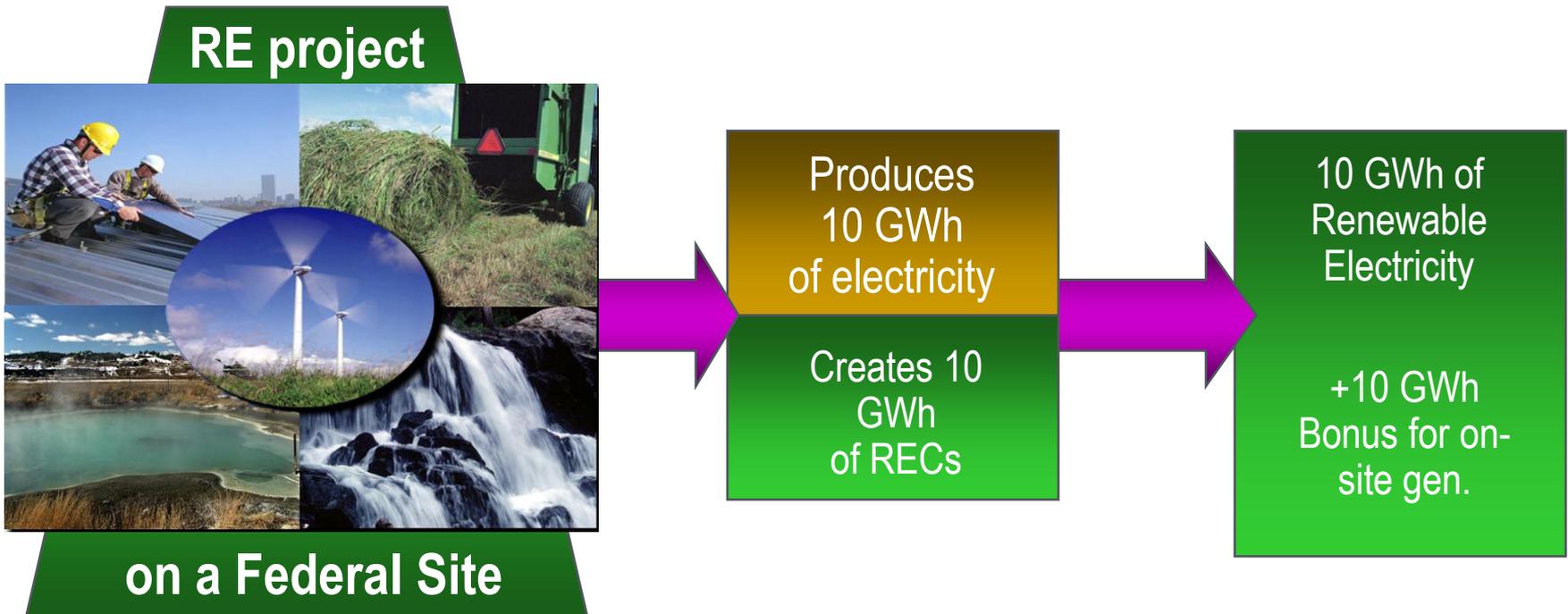


Step 4: Address key issues

- Renewable energy certificate (REC) ownership
 - RECs represent the environmental attributes of electricity produced from renewable sources
 - Ensure that PPA contract explicitly spells out REC ownership
 - If valuable RECs (usually solar) are sold, then must use “REC swap” option for credit towards EPACT 2005 renewable goal and on-site double bonus
 - REC Swap: sell valuable RECs, purchase cheaper national RECs
 - Federal Renewable Guidance
http://www1.eere.energy.gov/femp/pdfs/epact05_fedrenewenergyguid.pdf
 - Best to retain RECs unless expected price is much higher than national REC price
 - No credit towards EO13514 greenhouse gas reduction goals if RECs are sold
 - Federal Trade Commission proposed revised guidelines
 - Be careful how project is portrayed if RECs are sold

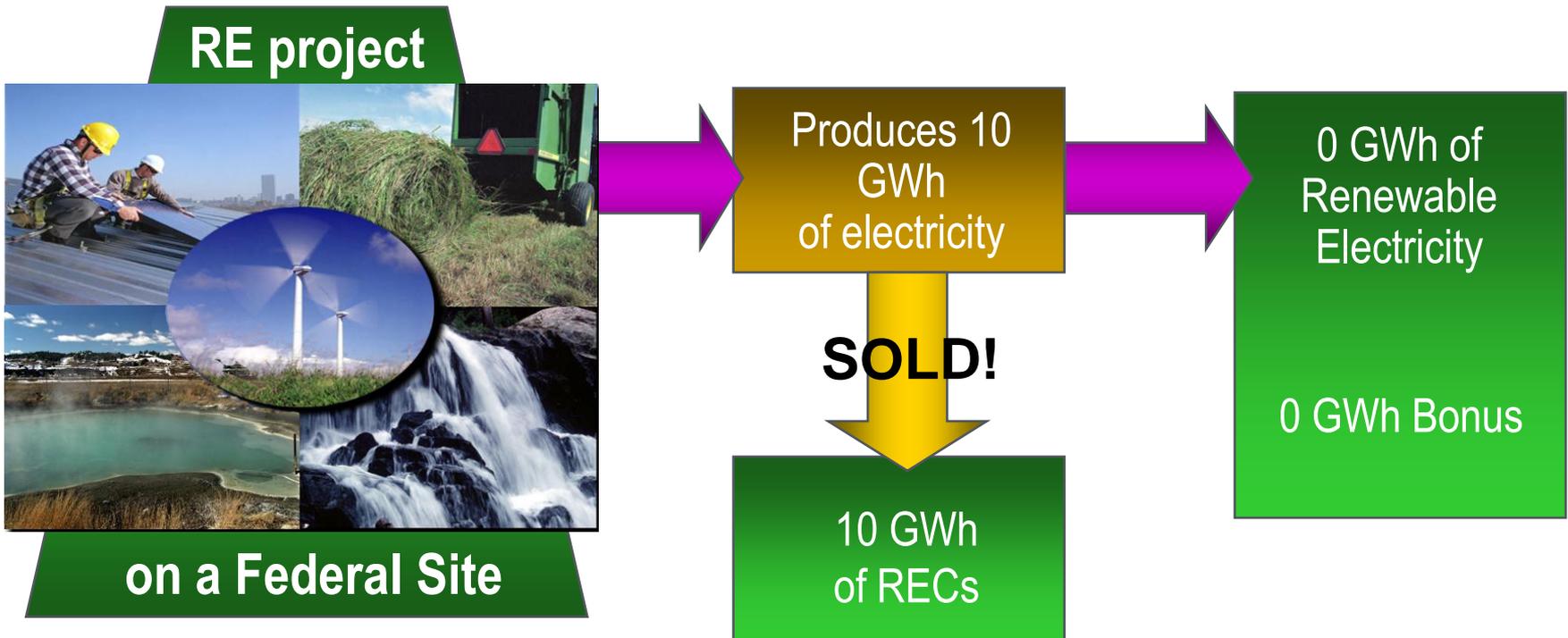
On-Site Project REC Options

Case 1: On-site project and RECs retained (ie. renewables are “used”)



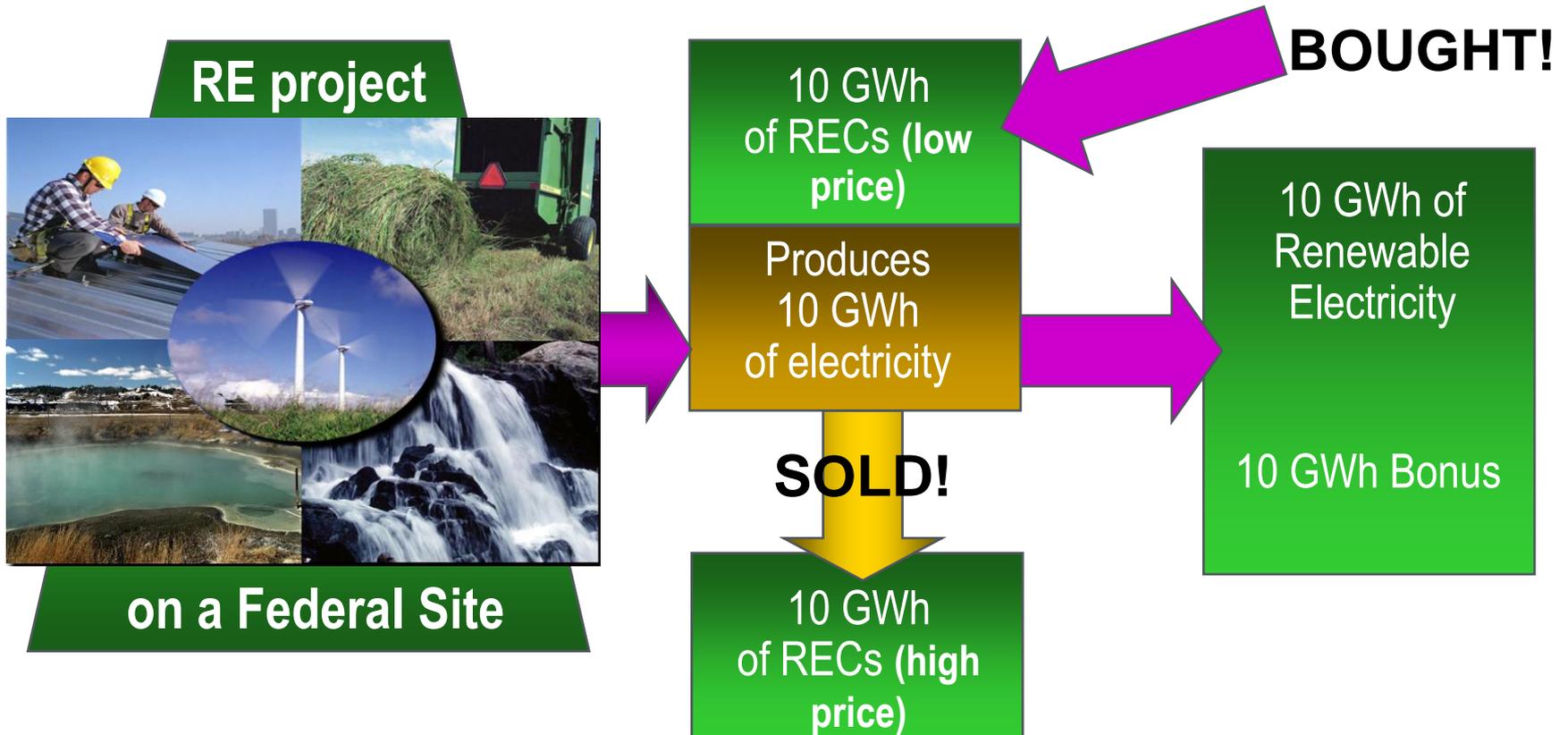
On-Site Project REC Options

Case 2: On-site project and RECs sold to improve project economics. This case does not count towards federal RE goal.



On-Site Project REC Options

Case 3: On-Site Project with “REC swap”,
so project counts towards the RE goal (“used”)



Step 4: High Level Approval

- Understand all approval requirements
 - Some agencies require high level/headquarters approval
 - Incorporate expected approval time requirements into project plan
- Ensure that all necessary approvals are completed before moving forward
- Possible approval considerations
 - Project location
 - Compatibility with mission
 - Future site infrastructure plans
 - Contracting vehicle and methodology rationale
 - Business case analysis

Step 5: Procurement

- Develop Request for Proposal (RFP), “Opportunity Notice,” or other procurement document
 - Renewable specifications
 - Allowable PPA price format (fixed price, escalation, other)
 - Proposal evaluation methodology options: best value, low price/technically acceptable (LPTA), low price
 - Evaluation criteria and submittal requirements
 - Infrastructure requirements: roads, fence, electrical upgrades, etc.
 - Metering requirements
 - End of contract options
 - Termination provisions
- Issue RFP and distribute widely
- Site visit, tour and pre-proposal meeting
- Proposal Evaluation

Step 6: Project Construction, Publicity And Operation

- Project construction
- Publicity
 - **Be careful what you say if RECs are not retained by the site. Consider new proposed Federal Trade Commission Green Guide revisions**
 - http://www.ftc.gov/bcp/edu/microsites/energy/about_guides.shtml
 - <http://www.ftc.gov/os/fedreg/2010/october/101006greenguidesfrn.pdf> (p.169 of pdf)
- Operation
 - Track actual production for annual reporting and to ensure system operation
 - Purchase replacement RECs if necessary

Example Federal PPA Projects

Nellis AFB PV Project in NV

- 14.2 MW single axis ground mounted PV on 140 acres including closed landfill
- PPA price – 2.2¢/kwh
- Estimated first year electricity savings = \$1 million, after standby charges
- RECs sold to Nevada Power (for state RPS solar set-aside)
- FAR Part 41 utility service contract
- Indefinite term with one year termination notice - using FAR Part 41 Procedures, Guidance and Information (PGI)*
- 20-year ground lease
- Ribbon cutting event December 2007
- Performance Monitoring web site
<http://mypowerlight.com/Commercial/kiosk.aspx?id=1dd14d57-7840-4b2d-af0a-0fe0fdd5c872>

*http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/dfars/PGI%2041_2.htm#TopOfPage



NREL PV Project in CO

- 720 kW (1200 MWh) single-axis tracking, ~ 5 acres
- 20-year PPA contract (utilizing Western)
- 20-year easement
- RECs sold to Xcel Energy for RPS solar set-aside (20 year contract)
- PPA price competitive with utility electricity price forecasts (based on EIA projections) at time contract was signed
- Operational December 2008
- Additional PV projects
 - 1083 kW ground-mounted system
 - 449 kW and 94 kW roof-top systems



Fort Carson PV Project in CO

- 2 MW, 3200 MWh in first year (~2% of Ft. Carson's load)
- Fixed, non-escalating energy rate
- 17-year contract, with 3 year option (utilizing Western)
- No cost 20 year lease (using 10 USC 2667 lease authority)
- RECs sold to Xcel Energy (20 year contract)
- Ground-mounted, fixed system covering 12 acre former landfill
- First Solar thin film, 25 year warranty
- Came on-line December 2007



GSA Sacramento PV Project in CA

- .5 MW roof-top PV (thin film)
- 10-year contract
- Price matched to utility energy rate, with price floor
- Utility rebate and federal incentives (30% tax credit & accelerated depreciation) - pay for approximately 1/2 cost
- License for use of roof
- Renewable developer retains RECs
- Came on-line March 2008



USCG Petaluma PV Project in CA

- 855 kW ground-mounted, fixed PV on slightly less than 4 acres
- PPA price is 13¢/kWh in the first year, with 3.5% annual escalation
- One year contract with 24 one year renewal options
- Irrevocable 25 year license
- Developer receives 22¢/kWh California Solar Initiative (CSI) performance based incentive (PBI) payments for first 5 years
- Site retains RECs
- Came on-line April 2010



Project Comparison

	Nellis AFB, NV	Fort Carson, CO	NREL, CO	GSA Sacramento, CA	USCG Petaluma, CA
Size	14.2 MW, 140 acres including closed landfill	2 MW on 12 acre closed landfill	2.3 MW total	.5 MW	855 kW on ~4 acres
Type	Ground Mounted, Single Axis Tracking PV	Ground Mounted, Fixed PV	Two Ground Mounted, Single Axis Tracking systems & two roof-top PV systems	Roof-top PV	Ground Mounted, Fixed PV
PPA Contract Length	Indefinite with 1 year termination	17 with 3 yr option	20 years	10 years	1 yr with 24, 1 yr options
Land Use Agreement	Lease (20 yrs)	Lease (20 yrs)	Easement for ground systems, license for roof systems (20 yrs)	License (10 yrs, included in PPA)	Irrevocable License (25 years)
Procurement and Contracting Agent	Site	Site, in partnership with Western	Site, in partnership with Western	Site	Site
RECs	Sold to utility	Sold to utility	Sold to utility	Retained by renewable developer	Transferred to site

PPA Request For Information

PPA Request for Information

- Background
 - PPA issues identified based on meetings/telecons with key federal agency staff with PPA project experience
 - RFI issued on March 2, 2011
 - Responses due April 11, 2011
- RFI and RFI response summary posted on FEMP PPA web site
 - http://www1.eere.energy.gov/femp/financing/power_purchase_agreements.html

PPA Request for Information Issues

- Contract length limitations
- End of Contract, Disposition of Renewable Project
- Termination for Convenience
- Site Access/Land Use Agreement Options
- Creation of Special Purpose Entities for Project Development

PPA Support, Resources & Key Points

Key Points

- Ensure that the PPA option is allowed
- Contact your serving utility early on
- Research applicable incentives and policies (<http://www.dsireusa.org/>)
- Review contract length options
- Determine NEPA and other environmental/permitting requirements and start the process early
- Discuss land use agreement options, approval process and develop agreement
- Consider renewable tie-in options (taking into account utility metering for your site)

PPA Support

- Renewable screening to identify cost effective renewable projects
 - Provide basic information using form available at http://www.eere.energy.gov/femp/financing/espcs_techplanning.html
- Assistance throughout PPA project process, such as:
 - Market research
 - Solicitation development
 - Proposal evaluation
 - Assistance with other issues such as coordination with local utility, NEPA and land use agreement

Resources

- **Chandra Shah**, National Renewable Energy Laboratory (NREL)
chandra.shah@nrel.gov, 303-384-7557
- **Gerald Robinson**, Lawrence Berkeley National Laboratory (LBNL)
gtrobinson@lbl.gov, 510-486-5769
- **Mike Warwick**, Pacific Northwest National Laboratory (PNNL)
mike.warwick@pnl.gov, 503-417-7555 (for DOD sites)
- **Andrea Kincaid**, DLA Energy
andrea.kincaid@dla.mil, 703-767-8669
- **John Nelson**, DLA Energy
john.nelson@dla.mil, 703-767-8523
- **Randy Manion**, Western
manion@wapa.gov, 720-962-7423
- **FEMP PPA Web Site:**
 - http://www.eere.energy.gov/femp/financing/power_purchase_agreements.html
 - PPA Quick Guide http://www1.eere.energy.gov/femp/pdfs/ppa_guide.pdf
 - PPA Presentation (updated on periodic basis)
 - Sample Documents

Resources

- Alternative Financing Options June 2010 webinar recording (covering PPA, UESC, ESPC)
http://apps1.eere.energy.gov/femp/training/course_detail_ondemand.cfm/CourseId=44
- “Procuring Solar Energy: A Guide for Federal Facility Decision Makers”
http://www1.eere.energy.gov/solar/federal_guide/
- FEMP Focus article (Fall 2007, p. 16-17)
<http://www1.eere.energy.gov/femp/news/fempfocus.html>
- EPA Solar PPA web site and 7/28/09 webinar (for all sectors, not just federal)
<http://www.epa.gov/greenpower/buygp/solarpower.htm>
http://www.epa.gov/greenpower/events/july28_webinar.htm
- NREL report “Solar Ready Buildings Planning Guide” (solar-ready specifications for new buildings/roofs)
<http://www.nrel.gov/docs/fy10osti/46078.pdf>
- Solar Today article: “Solar Energy with No Money Down” by Jason Keyes, Joseph Wiedman, Christopher Cook and Tucker Cottingham (September/October 2010, p.44)
<http://www.solartoday-digital.org/solartoday/20100809#pg44>

PPA Web Site

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Power Purchase Agreements

Power purchase agreements (PPAs) allow Federal agencies to fund on-site renewable energy projects with no up-front capital costs incurred.

With a PPA, a developer installs a renewable energy system on agency property under an agreement that the agency will purchase the power generated by the system. The agency pays for the system through these power payments over the life of the contract. After installation, the developer owns, operates, and maintains the system for the life of the contract.

FEMP developed an [introductory guide to PPAs](#)  for Federal on-site renewable projects.

The U.S. Department of Energy (DOE) issued a [PPA request for information \(RFI\)](#)  on March 2, 2011. The RFI identified PPA project barriers and requested input from the private sector regarding how to best address these barriers. FEMP received responses on April 11, 2011, and compiled a [summary of the responses](#) . A [Federal Utility Partnership Working Group \(FUPWG\) presentation](#) further outlines the RFI.

Project Information

FEMP outlines the power purchase agreement process in its Alternative Finance Options (AFO) webinar. An [on-demand recording of the training](#) is available. Dates and times of upcoming training sessions are posted to the [FEMP events calendar](#).

PPA Web Site

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Sample Documents for Power Purchase Agreements

FEMP works with Federal agencies and partners to assemble sample documents from past power purchase agreement (PPA) projects. The purpose of these documents is to provide sample resources to help streamline the PPA process for Federal agencies.

The following sample documents are organized into:

- [Requests for Proposal and Contracts](#)
- [Land Use Agreements](#)
- [Completed Projects and Case Studies](#)
- [Other Documents](#)

Requests for Proposal and Contracts

Sample documents are available for the following requests for proposal:

- [Photovoltaics at the Department of Energy's \(DOE\) Princeton Plasma Physics Laboratory](#)  PPA request for proposal issued by Energy on behalf of Princeton Plasma Physics Laboratory.
- [National Renewable Energy Laboratory \(NREL\) Photovoltaics Opportunity Announcement](#): Opportunity announcement issued for NREL Mesa Top photovoltaics (PV) power purchase agreement.
- [General Services Administration Photovoltaics Project in Sacramento, California](#)  Request for proposal issued for the General Services Administration (GSA) Photovoltaics Project in Sacramento, California.